REPORT

OF THE

Committee on Water Supply

OF THE

Town of Southborough

JANUARY, 1909

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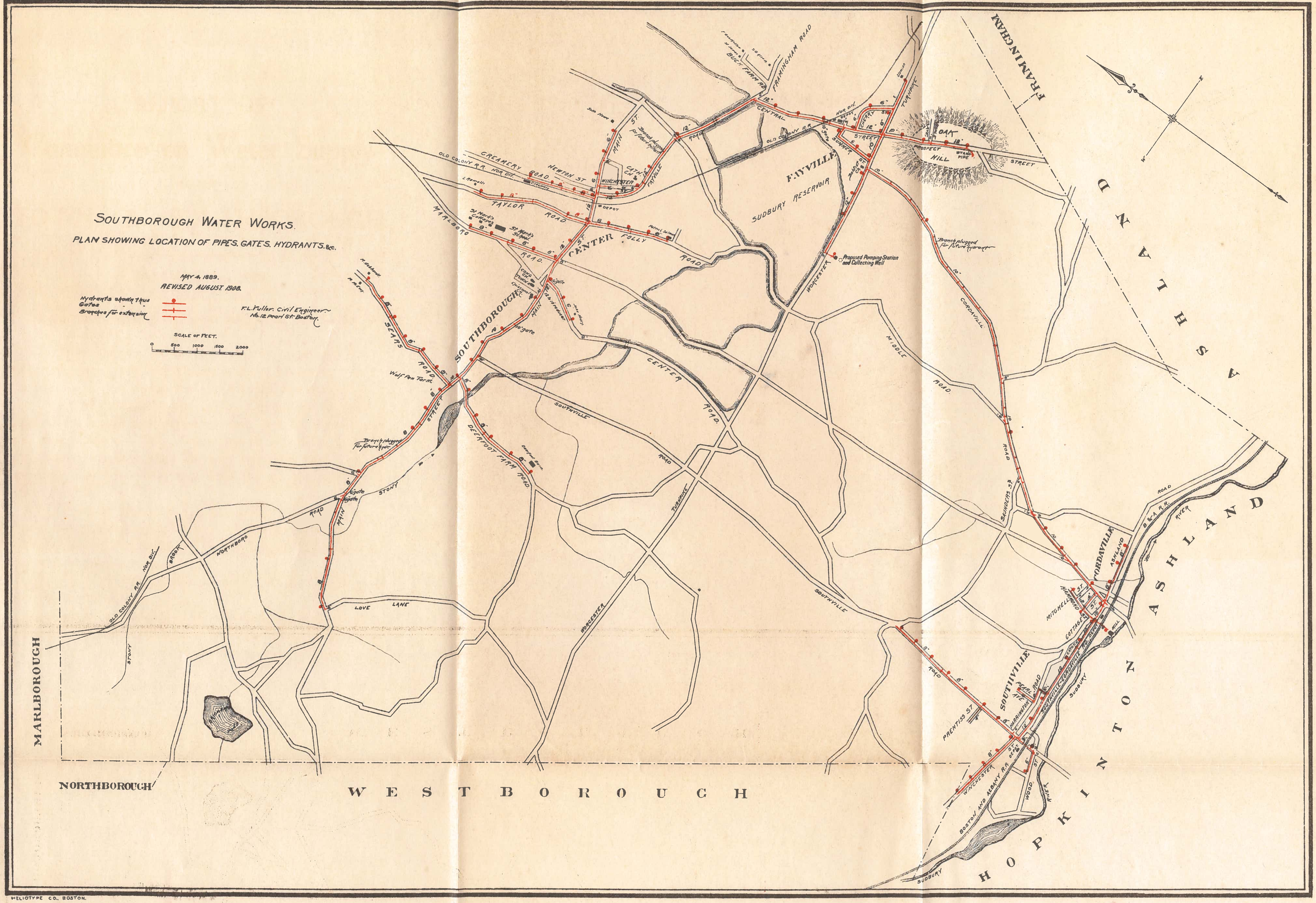

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JANUARY 1st, 1909

At a special meeting called on May 13th, 1908, the following unanimous vote was passed :—

VOTED :—That a committee of five be appointed by the Chairman, one from each village and one at large, for the purpose of investigating the question of water supply for the Town of Southborough. This Committee to employ experts or agents and expend a sum not to exceed one thousand dollars. This Committee to report in print to each voter not later than January 1st, 1909, and that no action in the matter be taken until the annual meeting in March, 1909.

The Chairman appointed as a Committee Charles L. Fairbanks for Southborough, Francis Wright for Fayville, J. J. Henderson for Cordaville and Paul S. Lincoln for Southville and Robert M. Burnett at large.

At the first meeting of the Committee, Robert M. Burnett was elected Chairman.

The Committee employed Mr. Frank L. Fuller of Boston, a competent engineer, who made the report for the Town on the same question nineteen years ago, as they con-

sidered that Mr. Fuller's experience and knowledge of the ground he had already gone over would greatly facilitate his investigation at this time. The conditions in obtaining a water supply for the villages of Southborough have changed materially in the past nineteen years. Under the taking of 1894 by the City of Boston, the Town of Southborough reserved the right to take two hundred thousand (200,000) gallons of water from the present supply for the use of its inhabitants but the Committee with the advice of its engineer, thinking a better supply could be obtained from a large well in close proximity to the Reservoir have employed a competent firm, under the direction of the engineer, to make investigations of adjacent lands for the location of such a well.

The report of the engineer to the Committee explains more fully what has been done and the results. The Committee expected to have a report from the State Board of Health in regard to source of supply, but regret to say the State Board will not be ready to report before the middle of January. The engineer in his report, by the advice of the Committee, has made two water districts, one consisting of the villages of Southborough and Fayville and a second of Southville and Cordaville, to be added if necessary. This plan consists of a pumping station at the well to be run either by oil or electric power, the latter of which is offered furnished by the Marlboro Company. The proposed situation of the stand pipe is the same as in the former report, on the top of Oak Hill, if the land can be bought at a reasonable figure. It has been suggested to the Committee that in case the Town of Southborough decides and votes for a water supply, that instead of an eighty foot iron tank, as recommended by the engineer, a sixty foot concrete tank of the same capacity would be preferable and would make little difference in regard to pressure, also that it would be an attraction instead of an eyesore to the town and the surrounding country.

The estimated expense would be, from the engineer's report for the Southborough and Fayville System—			$104,268.45
The annual interest on this cost, at four per cent. would be—	$4,170.73		
The cost of running the works, judging from the expenditures of other towns on similar works, would be—	2,500.00		
The legislation of the State in regard to water has always required the establishment of a sinking fund that would pay the debt in thirty years. This would require each year about—	1,785.07		
Annual expense for Southborough and Fayville system—		$8,455.80	
The extension to Cordaville and Southville would add to this amount—			45,169.03
Interest on same, annually, at 4%	1,806.76		
Running Expenses	500.00		
Sinking Fund	774.09		
Total for Southville and Cordaville		3,080.85	
Total amount required for whole Town		$11,536.65	$149,437.48

Amounts brought forward		$11,536.65	$149,437.48
	INCOME		
The estimated income from the villages of Southborough and Fayville (first district would be			
80 Family Meters, at $10.00	800.00		
Cordaville and Southville (second district) would give—			
20 Family Meters at $10.00	200.00		
Total for two districts—		1,000.00	
which would leave a balance of			
which expense would have to be met by the town.		$10,536.65	
Allowing for an additional income from hydrants in Southborough & Fayville,			
66 at $25.00	1,650.00		
and Cordaville and Southville, 34 at $25.00	850.00		
Total		2,500.00	
would still leave a deficiency to be met of		$8,036.65	

a year. The income allowed has been estimated from the signatures that could be obtained to a petition circulated and shown to all owners whose houses were on the pipe line as laid down in the

engineer's report. The committee have added 20% to the number of signatures obtained, a copy of the petition following :—

"PETITION FOR A WATER SUPPLY"

We, the undersigned, do hereby agree in case a water supply is introduced into the Town to be a user of the same upon the following terms :—The minimum cost shall be ten dollars ($10.00) per annum, which will allow the use of twenty thousand (20,000) gallons per annum or less, any excess of this amount to be paid for at thirty cents per thousand gallons. All the water to be metered, the meter to be installed and owned by the Town. The Town to lay the service pipe to the street line at its own expense. Expense of service pipe from street line to be met by the abuttor. All work between main and meter must be done under the direction of the Town.

The owners of property in the villages where the water supply would be furnished would also save about 20% in the cost of fire insurance, by the extra protection of the system.

Ten dollars is supposed to give each family twenty thousand (20,000) gallons a year by meter and if anything more than this is used the amount is to be paid for at thirty cents per thousand gallons.

The Committee believes that the object of the Town in its appointment was merely to furnish information and to make no recommendations. The advantages to be derived from a good water supply are too obvious to require repeating. The unfortunate part of it is that no system can be introduced to carry water to the parts of the Town where it is most needed and where it would be of the most use, in other words to the houses and farms outside of the villages. The advantages would be almost entirely to the inhabitants of the villages. Of course it is impossible under the present severe requirements of the Metropolitan Water Commission to expect manufacturers to locate their plants in Southborough or its villages and the chances are that as the years

go by the inducements will be less rather than greater in this respect.

MESSRS. R. M. BURNETT,
FRANCIS WRIGHT,
C. L. FAIRBANKS,
J. J. HENDERSON,
PAUL S. LINCOLN.

ENGINEER'S REPORT

Committee on Water Supply, Southborough, Mass.

GENTLEMEN:—At your request, I have revised my estimate of the cost of a water works plant for your town made in 1889, and also the map of the town accompanying that report showing the system of pipe distribution.

On account of the growth of the town, several streets have been added to the original estimate, the proposed length of pipe at the present time being 13.0 miles as against 10.5 in the former estimate. Since the first survey and estimate were made, the Sudbury Reservoir has been built, and several streets discontinued, but none in which it was proposed to lay pipe.

The original estimate of rock was undoubtedly too small. The present figures were arrived at in consultation with Mr. Wm. A. Gould, Highway Surveyor, who by actual experience is well qualified to judge of the quantity likely to require removal. While the amount, as it appears in the estimate, seems to the writer, from his experience in other towns, to be excessive, it may not be so. There is no doubt that considerable quantities of boulders and ledge will be encountered.

The price of cast iron pipe at the time of the first estimate (1889) was $27.23 per ton of 2000 lbs., while at the present time it is $24.00. Other materials, as well as the cost of laying pipe are no higher than at that time.

A steel stand-pipe of somewhat larger diameter is proposed, as its increased capacity is a decided advantage.

The estimate for a pumping plant is based on a capacity of 350 gallons per minute raised to a stand-pipe on Oak Hill, divided into two units of 175 gallons each. This will require each engine to be of 18 H. P. Each engine is to operate an 8 in. x 8 in. single acting triplex pump by belt connection. In six hours each pump will deliver 63,000 gallons, or 126,000 gallons if both are run.

The estimated cost of this plant, in running order, is $5,500. The fuel to be used is crude oil costing about 5 cents per gallon.

A somewhat larger plant, having a capacity of 200 gallons per unit per minute could be installed at an estimated cost of $8000. This would include two crude oil engines of 35 H. P. each. Each engine to operate an 8½ in. x 10 in. triplex single acting pump. In this, as in the preceding plant, one or both units can be operated as required. The time of pumping can, of course, be extended.

For several years, one unit may be sufficient, but it will be wise to install two.

An estimate of the cost of fuel used per year of 365 days for 35 H. P. used for 6 hours per day, is about as follows:

Crude oil at 5 cents per gallon, one gallon of oil being allowed to each 7 H. P. hours.	$ 547.50
Coal at $5.50 per ton of 2000 lbs. 5 lbs. coal being allowed for each H. P. hour.	$1073.10
Electric current at $0.02 per K. W. hour.	$1143.62

The crude oil and electrically operated engines require but small space, no chimney or boiler, and a much smaller and less expensive building than a steam plant; and also less attention in operation, and for small plants are largely superseding the latter.

The crude oil plants, of which many are in operation, are

giving excellent satisfaction, and is the one recommended for Southborough.

A supply from a ground water source being considered by far the most satisfactory, an attempt was made, by means of driven test wells, to find a locality not far from the Sudbury Reservoir, where the soil was sufficiently porous to yield the needed amount of water of satisfactory quality. Wells have been driven during the past summer and fall on the Buck farm, so called, north of the Fayville Road and on the east side of the reservoir. Also at the Bagley gravel or sand pit, on the west side of the reservoir, just south of the N. Y., N. H. & H. R. R. One well in the latter locality yielded a small amount of water, but at fifteen feet in depth the well struck ledge.

Three wells on the south side of the Worcester Turnpike, near the ice house, were driven to depths of about 30 feet, without striking ledge, and all yielded a small amount of water. An analysis of the water indicates that it is of good quality. This is the locality which gave the best results in the examination made in 1889. As the approval of the State Board of Health must be obtained, further investigation may be necessary.

With this report a revised map of the town showing size and location of street piping, together with fire hydrants and gate valves, is submitted. Also a revised estimate giving cost in detail of the complete system for Southborough Centre and Fayville, and in addition the cost to extend the supply to Southville and Cordaville.

Respectfully submitted,

F. L. FULLER, Civil Engineer.

12 Pearl Street,
Boston, Dec. 15, 1908.

SOUTHBOROUGH WATER WORKS

(SOUTHBOROUGH CENTRE AND FAYVILLE)

ESTIMATE OF COST

STREET	FROM	TO	12 in.	10 in.	8 in.	6 in.	4 in.
Central	Fayville road	Worcester turnpike	3000				
Centre road	Main street	John Neary's house				959	
Cherry	Centre street	Worcester turnpike				1160	
Creamery road	Main street	Creamery			1668		
Deerfoot Farm road	" "	I. Hosmer's house			2636		
Fayville road	" "	Centre street	4230				
Folly road	" "	Patrick Salmon's			1819		
Main	Love lane	Sears road			5820		
"	Sears road	St. east of Cong'l Church		2920			
"	St. east of Cong'l Church	Fayville road	2430				
"	Fayville road	Seth Howe's house				1461	
Prospect	Worcester turnpike	Stand Pipe	2391				
Sears road	Main street	M. McEvoy's cottage			3000		
Summer	Central street	Worcester turnpike				1070	
Taylor road	Main street	L. Ramelli's house			2632		
Winchester	" "	Hydrant				400	
Worcester turnpike	Central street	Fred C. Slawson's house				1300	
" "	Pumping Station	Prospect street	2300				
Hydrant branches						600	
			14351	2920	17575	6950	

14,500 lineal feet 12 in. pipe laid at $1.26		$18,270.00
3,000 " " 10 " " " " 1.04		3,120.00
17,700 " " 8 " " " " 0.81		14,337.00
7,100 " " 6 " " " " 0.61		4,331.00
42,300 " " 8.01 miles		$40,058.00
Rock excavation, 7,055 cu. yds. (estimated) $3.75		26,456.25
Collecting Well near Worcester Turnpike, Fayville		9,000.00
Brick or Concrete Pumping Station		2,500.00
Pumping plant, oil engines in duplicate, combined capacity 350 gals. per minute		5,500.00
Steel stand pipe, 30 in. diam. x 80 ft. high, including foundation		7,500.00
Special Castings		800.00
66 two nozzle hydrants at $25.00		1,650.00
GATE VALVES		
20-12 in. at $31.00	$620.00	
5-10 " " 24.00	120.00	
18- 8 " " 17.00	306.00	
8- 6 " " 11.00	88.00	
51 cast iron extension gate boxes at $3.75	191.25	1,325.25
		94,789.50
Add 10 per cent. for engineering and contingencies		9,478.95
		$104,268.45

Southville and Cordaville

STREET	FROM	TO	12 in.	10 in.	8 in.	6 in.	4 in.
Ashland road	Cordaville road	Easterly to last house			1337		
Cottage	Hammond street	Cordaville road					412
Cordaville road	Worcester turnpike	Ashland road		11045			
Hammond	Southville, Cordaville rd.	Last house				800	
"	" " "	Cordaville Mill			400		
Harrington road	Pearl street	New street				260	
New	Southville, Cordaville rd.	Harrington road				140	
Pearl avenue	Harrington road	Victor Flood's house				460	
Prentiss	Southville road	B. F. Prentiss' house					376
Southville road	Southville, Cordaville rd.	Ephraim Ward's house			4000		
" "	" " "	Wood street				370	
Southville, Cordaville rd.	Southville road	Cordaville road		3550			
Winchester	" "	Westboro line			2000		
Wood	" "	End				450	
Hydrant branches						300	
				14595	7737	2780	788

14,650	lineal feet 10 in. pipe laid at $1.04		$15,236.00
7,800	" " 8 " " " " 0.81		6,318.00
2,900	" " 6 " " " " 0.61		1,769.00
800	" " 4 " " " " 0.50		400.00
26,150	" " 4.95 miles		$23,723.00
Rock excavation 4100 cubic yards (estimated) at $3.75			$15,375.00
Special Castings			500.00
33-2-2½ in. nozzle hydrants at $25.00			825.00

GATE VALVES

14-10 in.	at	$24.00	$336.00
7- 8 "	"	17.00	119.00
5- 6 "	"	11.00	55.00
3- 4 "	"	7.00	21.00
29- cast iron Extension gate boxes		3.75	108.75
			639.75
			41,062.75
Add 10 per cent. for engineering and contingencies			4,106.28
			$45,169.03

This estimate based on cast iron pipe at $24.00 per ton of 2,000 lbs. f. o. b. Southborough.

Estimate based on Pumping Station being located on Worcester St., near Fayville.

Amount of rock based on estimates given by Mr. Gould, Highway Surveyor.

TABLE OF ELEVATIONS.

Also head in feet and pressure per square inch, due to high water in proposed stand pipe on Oak Hill.

	Elevation.	Head in ft.	Pressure in lbs. per sq. inch.
Top of iron tank, or stand pipe, 80 feet high, summit of Oak Hill	499.	0.	0.
Summit of Marshall's Hill	440.	59.	26.
Intersection of Main st. and road to Northborough	278.	221.	96.
Top of stone post opposite J. T. Burnett's gateway	302.	197.	85.
Top of post opposite The Sears' barn	284.	215.	93.
Step of Wolf Pen farm office	285.	214.	93.
Top of underpinning of The Joseph Burnett house abt	267.	223.	97.
Intersection of Main st. and Southville road	270.	229.	99.
Step of C. F. Choate, Jr. house	281.	218.	94.
Lower stone step of Town Hall	336.	163.	71.
N. Y., N. H. & H. R. R. track at Southborough Crossing	303.	196.	85.
Top of underpinning of Cath. church, Southborough	331.	168.	73.
N. Y., N. H. & H. R. R. track at Fayville Crossing	276.	223.	97.
Intersection of Prospect st. and Worces. turnpike	316.	183.	79.
Summit of Oak Hill, Fayville	419.	80.	34.
N. Y. Central R. R. track at Southville	267.	232.	100.
Top of Webster's Hill, Southborough	352.	147.	63.
Top of brick underpinning, Cath. church Cordaville	298.	201.	87.
Door sill of lockup, Cordaville	263.	236.	102.
N. Y. Central R. R. track at Cordaville	253.	245.	107.
Summit of hill, Winchester st. Southville	308.	191.	83.
Top of spire, Cong. church, Southborough, abt.	462.	37.	16.
Top of spire, Cath. church, Southborough, abt.	402.	97.	42.